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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,653	06/20/2006	Takeo Okabe	OGOSH56USA	8832
270 7590 09/01/2010 HOWSON & HOWSON LLP 501 OFFICE CENTER DRIVE SUITE 210 FORT WASHINGTON, PA 19034				
EXAMINER				
BAND, MICHAEL A				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
09/01/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

# Office Action Summary

**Application No.**

10/596,653

**Applicant(s)**

OKABE ET AL.

**Examiner**

MICHAEL BAND

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 7-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/12/2010 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 10-14, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) in view of Morita et al (JP No. 07268617).

With respect to claims 1 and 17, Zhang et al discloses a sputter target assembly including a high purity copper alloy sputter target [12] having a back face [14] diffusion bonded directly to a backing plate [16] of a copper alloy (fig. 1; abstract; col. 1, lines 56-

67; col. 2, lines 1-21). However Zhang et al is limited in that it is not suggested to include Ni or Si in the Cu alloy backing plate.

Morita et al teaches forming a sputtering target and a backing plate from an Al-M alloy, where M is one or more of Mg, Cr, Ni, and Cu (abstract; para 0013), thus Morita et al teaches a Cu-Al alloy backing plate. Morita et al also teaches having M (i.e. Cu) controlled to 1-40 wt%, with Si between 0.02-1.0% and Ni between 2-40% (abstract), where it is more desirable to have a Si percentage between 0.03-0.8% and preferably 3-20% (para 0029 and 0030). Morita et al cites the advantage of including Ni and Si in these percentages as yielding a highly workable Cu-Al alloy sputtering target capable of forming a uniform and high-quality film (abstract).

It would have been obvious to one of ordinary skill in the art to include Ni and Si in the percentages taught by Morita et al into the Cu alloy backing plate of Zhang et al to gain the advantage of yielding a highly workable Cu-Al alloy sputtering target capable of forming a uniform and high-quality film.

With respect to claims 10 and 20, modified Zhang et al further discloses a copper alloy having similar weight percentages of Cr, Ni, and Si as discussed above. Therefore it is expected that the copper alloy backing plate possesses the properties of an electrical conductivity of 35 to 60% and 0.2% proof stress of 400 to 850 MPa. See MPEP 2112.01, Section I. If not, it must be due to a structural limitation not currently present.

With respect to claims 11-14, modified Zhang et al further discloses using a hot isostatic pressing (HIPing) method to use diffusion bonding of the target and backing

plate (col. 5, lines 4-9), where the diffusion bonding is at a temperature of about 350°C (col. 5, lines 51-59).

4. Claims 2, 7-9, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) and Morita et al (JP No. 07268617) as applied to claims 1 and 17 above, and further in view of Fukada (JP No. 03079734).

With respect to claims 2 and 18-19, the references are cited as discussed for claims 1 and 17. However modified Zhang et al is limited in that specific percentages of Cr and Mg present in the backing plate are not suggested.

Fukada teaches a copper alloy for a backing plate, where the copper alloy comprises 0.05 to 0.8% Cr, 0.001 to 0.5% Mg, and 0.01 to 0.3% Si (abstract). Fukada cites the advantages of the specified weight percentages as reducing deformation due to thermal strains, permit repeated use, and improving the heat conductivity (abstract).

It would have been obvious to one of ordinary skill in the art to use the specified copper alloy weight percentages taught by Fukada for the copper alloy backing plate of modified Zhang et al to gain the advantages of reducing deformation due to thermal strains, permit repeated use, and improving the heat conductivity.

With respect to claim 7, modified Zhang et al further discloses a copper alloy having similar weight percentages of Cr, Ni, and Si as discussed above. Therefore it is expected that the copper alloy backing plate possesses the properties of an electrical conductivity of 35 to 60% and 0.2% proof stress of 400 to 850 MPa. See MPEP 2112.01, Section I. If not, it must be due to a structural limitation not currently present.

With respect to claims 8-9, modified Zhang et al further discloses using a hot isostatic pressing (HIPing) method to use diffusion bonding of the target and backing plate (col. 5, lines 4-9), where the diffusion bonding is at a temperature of about 350°C (col. 5, lines 51-59).

5. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) in view of Ishikura (JP No. 01180976).

With respect to claim 15, Zhang et al discloses a sputter target assembly including a high purity copper alloy sputter target [12] having a back face [14] diffusion bonded directly to a backing plate [16] of a copper alloy (fig. 1; abstract; col. 1, lines 56-67; col. 2, lines 1-21). However Zhang et al is limited in that including Be into the copper alloy is not suggested.

Ishikura teaches a backing plate for sputtering, where the backing plate is copper having a purity of at least 99.7% with Be added from 100~3000 wt. ppm (abstract). Since Ishikura teaches a copper alloy backing plate having the claimed weight percentages of Be, it is expected that the copper alloy backing plate possesses the properties of an electrical conductivity of 35 to 60% and 0.2% proof stress of 400 to 850 MPa. See MPEP 2112.01, Section I. If not, it must be due to a structural limitation not currently present. Ishikura cites the advantage of adding the Be to the backing plate as producing a significant cooling effect from satisfactory heat conductivity and the diffusion of Cu being inhibited (abstract).

It would have been obvious to one of ordinary skill in the art to incorporate adding Be to the copper backing plate taught by Ishikura for the copper alloy backing plate of

Zhang et al to gain the advantage of producing a significant cooling effect from satisfactory heat conductivity and the diffusion of Cu being inhibited.

### ***Response to Arguments***

#### ***103 Rejections***

6. Applicant's arguments with respect to claims 1-2 and 7-14 have been considered but are moot in view of the new ground(s) of rejection due to the new claim limitations requiring a copper alloy back face and a copper alloy backing plate bonded directly to said back face.

7. Applicant's arguments filed 4/12/2010 regarding claims 15-20 have been fully considered but they are not persuasive.

8. On p. 10-11, the Applicant argues that the Ni and Si content of the Al-alloy of Morita et al and the Ni and Si content in the Ni-alloy intermediate layer of Zhang et al cannot be the same to one of ordinary skill.

The Examiner agrees, however this argument is now moot in light of the new rejection above.

9. On p. 11-12, the Applicant argues that Zhang et al clearly states that it is necessary to use the interlayer between the sputter target and backing plate, thus Zhang et al teaches away from directly bonding the sputter target to the backing plate.

The Examiner respectfully disagrees. While Zhang et al does teach it is necessary to improve the bond strength between the sputter target and backing plate by using an interlayer (col. 2, lines 22-24), Zhang et al does teach that it is known to

directly bond via diffusion bonding a Cu target to a Cu alloy backing plate (col. 1, lines 56-67; col. 2, lines 1-21), thus Zhang et al teaches that diffusion bonding a Cu target directly to a Cu alloy backing plate is a nonpreferred embodiment, with it being held that the prior art anticipates a claim even though it teaches away from the claimed invention. See MPEP 2123, Section I. In addition it has been held that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments, with a known or obvious assembly does not become patentable simply because it has been described as somewhat inferior to some other assembly for the same use. See MPEP 2123, Section II.

10. On p. 12-13, the Applicant argues that the reference Ishikura (JP No. 01180975) does not teach adding Be to a copper alloy.

The Examiner agrees that this Ishikura reference does not teach using Be, however this was due to a typo, with the newly cited Ishikura reference (JP No. 01180976) cited above does teach adding Be in the claimed percentage to a copper backing plate.

11. All other arguments are directed towards the subject matter above and have been addressed accordingly.

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795